

ADDITIONAL RECORDS OF NORTH AMERICAN
CICADAS WITH DESCRIPTIONS OF NEW
SPECIES

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During the past few years several thousand cicadas from North America have been examined with the result that a number of species originally described from a few specimens are now much better known, and their distribution considerably extended. The present paper has been prepared with the idea of recording these facts, and the writer has also added some of the observations of others, kindly sent to him at the time the specimens were transmitted. Dr. Raymond H. Beamer and his associates from Kansas State University have succeeded in collecting a surprising number of species in their annual biological field trips. The notes and observations of the trip of 1929 were recorded by L. D. and R. H. Beamer in this JOURNAL for September, 1930, and make interesting reading to a student of the group.

While the species of cicadas known from the United States and Canada have been noticed in the several papers published in this JOURNAL, thus making the information easily accessible, there is need for an annotated list, and it is hoped that one can be prepared in the near future. It is likely, however, that there are a number of other species to record, and the considerable periods that certainly elapse between the appearance of the broods of the species occurring in any given locality, will prevent, for a long time, the making of a reliable list for even a single state.

Two new species and several varieties are described in the present paper, but it is likely that with more collecting the new forms of *Platypedia* mentioned, will in time, be regarded as species.

I am indebted to Mr. Everett C. Lerch, of the Staten Island Institute of Arts and Sciences, for all but two of the photographs included in the plates.

***Tibicen robinsoniana* Davis.**

The distribution and habits of this species are recorded in this JOURNAL, March, 1922, p. 41; 1923, p. 7; 1925, p. 38; 1926, p. 177, and 1930, p. 58. It was known from Virginia, Missouri and Tennessee. In 1930 Dr. R. H. Beamer and his companions extended the range to Mississippi and Alabama. Ten males were collected at Shuqualak, Noxubee County, Miss., on July 16, and also on July 16 Mr. Paul W. Oman collected a male and female at Gallion, Hale County, Alabama.

Dr. Beamer likened the song to one of the notes of a scolding blue jay, and noted the considerable resemblance in appearance to *Tibicen pruinosus*, but the song "entirely different." He heard them singing in numerous places as he and his party drove southward in Mississippi, and records that the majority were found in cedar trees and collected by shooting. At Shuqualak they were in oaks and cedars. In Alabama they were heard singing at Coatopa, and at Gallion they were on a dry hill sparsely set with small cedars.

***Tibicen cultriformis* Davis.**

This species was described in this JOURNAL for December, 1915, and up to the end of 1929 eleven specimens had been examined, all from Arizona and particularly from the southeastern part of the state along branches of the Gila River, or from Santa Cruz County.

Prof. E. D. Ball has recently sent me specimens from Payson, Gila County, Arizona, collected August 3, 1929, and Patagonia, Santa Cruz County, collected September 20, 1930, with the following report on the insect: "We moved into camp up on the east branch of the Verde, and in the afternoon there was not a single Cicada singing in the region. That night it rained and before morning the ladies in the tents were troubled with "bed-bugs"; very large sized ones which set them shrieking. In the morning I found about 50 pupae climbing up the trees in a little area about 10 rods long and 2 wide. From these I succeeded in hatching 10 or 15 specimens but owing to the wet weather most of these moulded. I took the rest of the pupae with me up to Long Valley to the next camp site and put them out in the shrub-

bery, but they had been in the paper box so long that they had dried up apparently too much to come out, and they fell off of the trees and were eaten by the chickens. Since then I have found this species in enormous numbers on the Santa Cruz river bottoms from Nogales up about 40 miles toward Tucson, but apparently it does not come any farther up in this area. They are found there on the cottonwoods and big black willows. I happened to get in there just as they appeared and was able to get quite a set. I was down there the last week in October this year [1931] and they were still howling vociferously in the trees."

Mr. D. K. Duncan found this large cicada very common but hard to locate high up in ash and sycamore trees along Hegler Creek, 10 miles north of Young, Gila County, Arizona, on September 1 to 4, 1930. He describes the song as an extremely shrill, intermittent chirp. They broke out once in a while when the sun was very hot and chirped for only a few minutes at a time, then kept quiet for an hour or so. About dusk they shrilled the loudest. But three were captured. Mr. Duncan further states that in passing through Pleasant Valley he stopped at Young, Arizona, for dinner. "While there a black cat ran up a sycamore tree and captured another of these cicadas. After chasing the cat I took it away from it undamaged. The lady said the cat made a habit of watching for them and when seeing one light in the top of a tree, would run up the tree and catch it. She said he caught some every day and would bring them down and play with them like a mouse. This sounds fishy, but nevertheless it is a fact. I asked her to take them away from the cat if possible and save them for me, and she said she would, but cannot depend upon it of course as she has other things to do besides taking away cicadas from the cat. Guess I should have bought the cat to catch them for me."

In 1931 Mr. Duncan reported that there were no *cultriformis* singing along Hegler Creek on June 15, but that they were very common and out of reach on September 1 and 2. They were also very common in Pleasant Valley. They were in sycamore, cottonwood, ash and walnut trees with no special taste for any particular kind.

Tibicen tigrina Davis.

In Landa Park, New Braunfels, Texas, July 14, 1931, my companions, Mr. E. V. Walter and Mr. Engelhardt, located a *Tibicen tigrina* by its song in a rather small tree, and succeeded in capturing it for me. The song is like that of *Tibicen inauditus* but louder. It is an even buzzing or *zing*, and may continue for some time. There were a number of *tigrina* about, but we could collect but the one male.

This species was described in this JOURNAL, December, 1927, from specimens collected by Otto M. Locke, Jr. It was formerly considered to be *Tibicen montezuma* Distant, but incorrectly, for we now have the true *montezuma* from Mexico. Of *tigrina* collected July, 1925, in the Arbuckle Mts., Oklahoma, Dr. Raymond H. Beamer wrote: "This species was taken over an area possibly ten to fifteen miles in extent, in cedars and oak. Its song was shrill and long continued while undisturbed. I found them exceedingly hard to locate, and some of them quite wild. As I remember its song very much resembled that of *Tibicen bifidus*." (See this JOURNAL, June, 1926, p. 178.)

Tibicen inauditus Davis.

We first heard *inauditus* in the Davis Mountains, Texas, at Tippit's Ranch. The song is a continuous low *zing*, and the insect is often much nearer than its song would seem to indicate. On June 29, 1931, we collected a male and female. The next day on the low oaks well up on Mitre Peak, the top of which we reached, we collected 9 males and 2 females. The insects relied for protection on their close resemblance to the bark of the oaks on which they rested. When discovered they usually could be picked off of the trees with one's fingers. Some Mexican boys collected 17 males and 1 female, and two young men, who were staying at Tippit's Ranch for a few days, collected 33 males and 15 females. Later in Chisos Mountains, on July 5, I collected 3 males and 1 female, also on oaks. Thus 83 specimens were secured of what has been a rather rare cicada in my collection.

I was much surprised to find that the songs of both *inauditus* and *tigrina* were continuous, that is lasting for a long time, in this respect differing markedly from the Tibicens of the eastern states in which the song is but of short duration.

Diceroprocta biconica Walker and **Diceroprocta bonhotei** Distant.

In *D. biconica* Walker, 1850, described from Cuba, the terminal dorsal spine of the last abdominal segment of the female usually does not bend upward to any great extent; the terminal part of the abdomen (sometimes the last three or four segments), is pruinose, while the area between the tympana is usually not conspicuously pruinose. Cuban specimens are as a rule lighter in color than those from Florida, and also than *bonhotei*.

In *Diceroprocta bonhotei* Distant, 1901, from the Bahamas, the terminal dorsal spine of the last abdominal segment of the female is usually bent upward, the area between the tympana is often conspicuously pruinose, and the terminal segments in both male and female are less pruinose than in *biconica*.

In the *Diceroprocta* from the Florida coast that have so far been examined there is much variation. A number of specimens viewed together resemble those from the Bahamas more than those from Cuba in the disposition of the pruinose areas. The terminal dorsal spine of the last abdominal segment of the female may be as in *biconica*, that is, not bent upward to any great extent, or it may have a considerable upward bend.

The observations on the Florida specimens are based mainly on an examination of the 12 females and 8 males labeled Key Largo, August 9, 1930, collected by Dr. Raymond H. Beamer and his three companions from the University of Kansas. There may be two closely allied species included in this series for Dr. Beamer reports: "We noticed that when a cicada started singing all others would sing a similar song; then in a few minutes that song would cease entirely and several cicadas would be singing another song. We supposed there were two species of cicadas until we succeeded in shooting a male while he was singing the second song. His appearance was so strikingly like the one we had taken singing the other song that we decided it must all be one species." Dr. Beamer, however, enquires "Did we take both *D. biconica* and *D. bonhotei*?"

No difference has thus far been detected in the males from Florida, and in the females the slant of the terminal spine is the only character in which a difference has been observed. In one case at least the spine was intermediate.

Diceroprocta cleavesi Davis.

This species was described in this JOURNAL, March, 1930, from a single male collected on Grand Cayman Island, British West Indies, April 17, 1929. Since the receipt of the type twenty additional males and eight females have been received from Capt. T. M. Oxford, a resident of the Island. The tergum or dorsal part of the abdomen in the females is edged with white, leaving a very much broader brown area than in the males, where the sides are conspicuously pruinose and the central ovoid brown area comparatively narrow. (See Plate VIII, fig. 2, March, 1930, JOURNAL, N. Y. Ento. Soc.)

In the original description of *cleavesi* the statement is made that the dorsal spine at the tip of the abdomen in the British Museum specimen examined by Mr. W. E. China is bent slightly upward, as in *bonhotei* Distant from the Bahamas. In the eight females sent by Capt. Oxford, the spine at the tip of the abdomen is bent upward in each instance. The central notch in the last ventral segment of the female is not more deeply cut than in occasional specimens of *biconica* from Cuba.

Diceroprocta cinctifera Uhler, and variety *limpia* new variety.

On July 4, 1931, the writer collected 14 males and 23 females of *cinctifera* from the bushes along the Rio Grande and a small tributary stream, at Hot Springs, Brewster County, Texas. The females were laying eggs in numerous small branches, while many of the males were singing their songs that usually continued from 10 to 20 seconds. I had supposed from the performance of some other species of *Diceroprocta* that the song would continue for a longer time without an intermission. A male was seen clinging to the stem of a small bush, head up. It was at first supposed to be alive, but was found to have died while clinging to the bush. Ants had eaten out its abdomen and some of them were present. A cicada usually falls to the ground when it dies.

All of the specimens collected or seen at Hot Springs and later at Del Rio belonged to the typical form described by Uhler from Dona Ana County,* New Mexico. As was pointed out in this

* Dr. Beamer has recorded *cinctifera* from near Isleta on the Rio Grande, central N. M. See this JOURNAL, September, 1930, p. 294.

JOURNAL for March, 1930, this form extends down the Rio Grande to Eagle Pass or to an altitude of about 600 feet or less where the variety *viridicosta* commences, and extends down the river to the coast, a distance of about 300 miles.

On July 7, 1931, Mr. George P. Engelhardt and I were at Fort Davis, Texas, where we again heard the song of *cinctifera* in the bushes and trees bordering the stream in Limpia canyon. Here owing to the character of the vegetation the cicadas were not as easily taken as at Hot Springs where there was but one tree, a cottonwood. Six males, however, were collected and it was noticed that the opercula were generally shorter and the extremities more rounded than in *cinctifera*, or in variety *viridicosta*; also that about the inner third of each operculum was black instead of the usual pale straw-color. The dark colored central stripe on the under side of the abdomen in the males was also much broader than is usual in the typical *cinctifera*. It was evident that we had collected a new variety of *cinctifera* for which the name *limpia* is proposed. Limpia creek joins the Pecos River, which in turn is a tributary of the Rio Grande. It may well be that the ancestors of the cicadas now found in Limpia canyon made their way from the Rio Grande up the Pecos River and Limpia Creek to the Davis mountains, and that isolation has brought about the changes observed.

The measurements in millimeters of the type specimen of variety *limpia* are as follows:

Length of body 27; width of head across eyes 10; expanse of fore wings 76; greatest length of operculum 6.

From above this variety resembles *cinctifera* in having the costal margin of the fore wings orange (not greenish) to the end of the radial cell. The black dash prominent in the front part of the basal cell in var. *viridicosta*, and also present occasionally but to a less degree in typical *cinctifera*, is quite conspicuous in variety *limpia*. The pruinose areas are about the same, but the legs have more numerous black streaks and spots than in *cinctifera*.

See this JOURNAL, March, 1921, p. 2 and March, 1930.

Diceroprocta apache Davis.

This species has been recorded from Arizona, Utah, Nevada and California. Lately Mr. J. E. Davis sent me for examination

a male and five females from as far west as Newport Beach, Orange County, Calif., collected by Paul S. Sloop, Sept., 1929. It probably occurs also in western Texas, but this needs confirmation. The species, together with related forms, are considered in this JOURNAL for December, 1928, and in the JOURNAL for September, 1930, Dr. Raymond H. Beamer gives a lengthy account of its habits from observations made during the biological field trip of Kansas State University in 1929.

Mr. Engelhardt and I arrived at Indio, in the Coachella Valley, California, near evening, June 20, 1931, and found *apache* quite common on the China berry trees along the sidewalk close to Hotel Indio, and also on an orange tree in the grounds about the hotel. Five males and 3 females were collected and later some were attracted to the lights in the hotel. The song, as was to be expected, was a continuous *zing*. To me it was not very loud or vigorous. In the early morning of June 21 I walked about the town and found a great many living *apache* and also many lying dead or nearly dead under some cottonwood trees and other trees along the streets. A native informed me that they were very common this year, perhaps more so than usual. I found a freshly emerged pupa crawling in the grass by the side of the road; also a male just developed and still limp and soft. I collected a number of pupae skins, also 72 male and 42 female adult cicadas, many of which had apparently died in the night and had fallen to the ground. They were in good condition. I also found a dead Cicada-killer, *Sphecius convallis* Patton and captured a living one.

At Indio the majority of the specimens were of the light brown variety of *apache*, as are those I have seen from other localities in California, and from Nevada and Utah. A few, however, were almost entirely black with the collar and wing veins straw-color or even green. In Arizona the dark variety is the prevailing form.

Diceroprocta eugraphica Davis.

On July 3, 1931, four males and three females were collected by the side of the road on various bushes on our way from Marathon, Texas, to Hot Springs on the Rio Grande. We found the

cicadas near to where the then dry bed of a stream crossed the road about 25 miles south of Marathon. The insects sang a low and continuous *zing*, as was to be expected. We went from Hot Springs to Mr. J. W. Potter's ranch near the base of the Chisos Mountains on July 5, and found *eugraphica* on some bushes near his garden. There was a small irrigated area, but the cicadas were on the slopes close by.

Diceroprocta bequaerti Davis.

This insect was considered a variety of *vitripennis* Say, in the paper on the Cicadas of the genus *Diceroprocta* in this JOURNAL for December, 1928, but not only is the head much larger than in *vitripennis* and the black stripe between the eyes does not reach the eyes as is usual in *vitripennis*, but also the obconical spots on the mesonotum have the posterior extremities more divergent and angulated than in that species. The collar is usually of a brighter green.

Dr. Raymond H. Beamer has sent for examination the following from Texas: a male from Aransas County, Aug. 6, 1928; 3 males and a female from Victoria Co., Aug. 9, 1928, and 4 males from Jackson Co., Aug. 9, 1928. Mr. F. F. Bibby has sent for examination a male from Sugarland, Cameron Co., Texas, June 20, 1929, and 6 males from Burleson Co., Texas, collected in July, 1930.

These specimens, and those already recorded in this JOURNAL as *bequaerti*, stand apart by the characters mentioned.

Diceroprocta swalei Distant, var. **castanea** Davis.

In the original description of *castanea* (= *swalei*) JOURNAL, N. Y. Ent. Soc., Vol. XXIV, pp. 49-51, March, 1916, is the statement: "One of the female paratypes constitutes a variety having the fore wings suffused entirely with brown, as well as about two thirds of the area of the hind wings." It is further stated that *Diceroprocta castanea* may prove to be a variety of *swalei*, but the name *castanea* can apply to the variety with the fore wings entirely suffused with brown, as shown in the female from the Santa Rita Mountains, Arizona, and included in the description. This is the female figured on plate 18, fig. 1, JOURNAL, N. Y. Ent. Soc., Vol. 36, December, 1928.

It is of interest that Prof. E. D. Ball collected 8 specimens of var. *castanea* in the Santa Rita Mts. June 22, 1930. He stated that he had additional specimens. With the above 8 specimens he sent 4 typical *swalei* from the Rincoon Mts., Ariz. Among the specimens received from O. C. Poling in 1924, and collected in the Boboquivari Mts., there is one male that may be placed as variety *castanea*. It would appear, however, from the collections thus far made that in the Santa Rita Mountains, var. *castanea* is the prevailing form.

Cicada chisos Davis.

We found this species associated with *Tibicen inauditus* in the Davis Mountains, Texas, and 14 males and 2 females were collected from June 29 to July 2, 1931. On July 5 we collected two males and two females in the Chisos Mountains. The song is not like that of *Cicada hieroglyphica* of the eastern states and Mississippi valley, but is a pulsating or trembling *ticker-ticker-ticker*. Now and then the song rises higher, and then drops to half-strength again, but continues for a long time unless the insect is disturbed. As with *inauditus* this species was usually in the oaks, but was much shyer than *inauditus*, and as a result we collected but the 20 specimens, though many more were seen.

Okanagana schaefferi sub-species **tanneri** Davis.

This insect was described and figured in this JOURNAL for March, 1930, from the male type, collected at Woodside, Utah, and three additional males collected at the same locality. Since the description was published Prof. Vasco M. Tanner has sent me 5 males and 12 females of *tanneri*, all collected at Woodside, Emery County, Utah, at the same time as the type. According to his letter of November 7, 1930, about 24 specimens were retained by him, so it will be apparent that the insect occurred at Woodside in considerable numbers.

This is the first record of the female of *tanneri*, and an examination of the considerable series reveals, that, like the males, they much resemble *schaefferi*, except for the considerable differences in color.

Okanagana fumipennis new species (Plate V, figs. 1 and 2).

Type male and allotype female from near Fort Garland, Costilla County, Colorado, June 11, 1930 (Sherman C. Bishop and Richard C. Hart). Davis collection.

This showy black and reddish-orange-colored insect resembles *Okanagana schaefferi* (see figure in this JOURNAL, December, 1927), but may be separated from it by the thickened venation and by having the wings milky and clouded.

Head narrower than the front margin of the pronotum; front considerably produced and prominent. Median sulcus of the front well defined. Pronotum with the humeral angles rounded, the anterior angles prominent and the sides considerably amplified. Last ventral segment with the sides converging toward the rounded extremity. Last ventral segment of the female with the notch single and without an inner notch. In some of the paratypes the sides of the notch are sinuate. Uncus black; when viewed from behind, with a shallow notch at the extremity. The valve extends slightly beyond the uncus; is black with the upper margin pale; in some of the paratypes it is almost entirely pale.

Fore wings moderately broad, as in *schaefferi*, but with coarser veins, and milky clouded from the base to the row of marginal cells. Basal cell opaque, almost black, the veins darkened and mostly of the same color throughout. In *schaefferi* the veins extending to the marginal cells are pale. Both pair of wings at base, as well, as the anal membranes are reddish-orange, as in *schaefferi*. In the hind wings the milky cloud extends to the margin.

Head black, with supra-antennal plates edged with pale. Pronotum black with a short, median pale line and margined with orange. In some of the paratypes the narrow pale border to the anterior margin is wanting. Mesonotum black, the posterior margin, the elevated \times and anterior spots pale; also a pale spot each side at base of the fore wings. Metanotum margined posteriorly with orange. Tergum black, with the segments margined posteriorly with reddish-orange. Beneath black, the legs variegated with reddish-orange, especially at the joints, and each abdominal segment margined posteriorly with reddish-orange, the last one about one-half orange. In the female the space about the ovipositor is reddish-orange.

Measurements in Millimeters

	Male Type	Female Allotype
Length of body	28	27.0
Width of head across eyes	7	7.5
Expanse of fore wings	65	67.0
Greatest width of fore wing	11	12.0
Length of valve	5	

The first specimens of this species received were two females from Jemez Springs, New Mexico, June 17 and 26, 1919, 6,400 feet elevation, collected by Mr. John Woodgate. At that time they were supposed to be *schaefferi*. In June, 1928, Dr. John W. Sugden, of Salt Lake City, sent me 5 males and 3 females collected in San Juan County, Utah, June 8, 1928. In the letter accompanying the insects he stated that they came from the sage brush flats north of Monticello, and that many of them were singing while clinging to the stems of the sage. "They were easily captured; were poor flyers and none voluntarily took to wing. Their song was strong and long continued. Many of the cast skins were found on the stems and on the ground. The holes were level with the surface of the ground." On September 16, 1931, Dr. Sugden wrote of *Okanagana schaefferi* collected near Mt. Carmel, Utah, the previous June, that the song was long and continuous, and that when a large number were singing together that it reminded him of the sound made by the machines that resharpen safety-razor blades. "I do not remember receiving such an impression in the colony that was observed near Monticello, San Juan County, in 1928. The Mt. Carmel cicadas were all on the juniper, although there was sage brush in the region, but the San Juan cicadas were on sage there being no juniper in the region."

In July, 1930, Prof. Sherman C. Bishop sent me 14 males and 6 females of *fumipennis* from Costilla county, southern Colorado, collected by him and Mr. Richard C. Hart, June 11, 1930, and a male from the adjoining Alamosa county, collected June 26, 1930. This led to a re-examination of the specimens, from New Mexico and Utah, with the conclusion that a distinct species resembling *schaefferi* was represented.

Prof. Bishop writes: "The specimens in the long series from near Fort Garland were from sage brush bordering the highway, emerging, singing and mating, June 11, 1930."

Species of *Okanagana* are usually lacking in easily noticeable characters on which to found names, but this is not the case with *fumipennis* now known from three states.

Okanagana nigrodorsata Davis.

This species was described in this JOURNAL for March, 1923. Up to that time thirteen specimens, all from the northern half of California, had been examined. More recent records are Sequoia Park, Calif., July, female (Collection Los Angeles Museum); near Lake Tahoe, Calif., 7,500 ft., July 5, 1931, two females (E. R. Hulbirt); Mt. Elias near Lake Tahoe, 8,700 ft., male July 6, 1931, and 7 males July 7, 1931 (E. R. Hulbirt).

The twenty-four specimens thus far examined closely resemble one another, and the species may be told by its all black color and the peculiar orange tint at the base of the wings and of the costal margin of the fore wing to the end of the radial cell.

Okanagana bella Davis.

This species has been recorded from Kansas and all of the states westward except Nevada, where it no doubt occurs. It is also native of Alberta and British Columbia. In June, 1929, Mr. Douglas K. Duncan collected a female in the White Mountains of Arizona. It is of interest that in this considerable range, embracing about one third of the area of the United States, that the race *rubrocaudata*, found in the mountains of Colorado, and near Raton, New Mexico, is the only notable variety.

Okanagana viridis Davis.

On August 5, 1930, Mr. F. F. Bibby collected a single female *viridis* at Midway, Madison County, in the eastern part of Texas. The specimen is in the collection of the Texas Agricultural Experiment Station, College Station, Texas. The species was previously known from five specimens as recorded in this JOURNAL for March, 1925. They came from Mississippi, Arkansas and Tennessee.

Okanagana rubrovenosa Davis

Records of this beautiful insect, usually found on the manzanita bushes are given in this JOURNAL for 1919, p. 213, and 1926, p. 187. Lately its distribution has been extended from California to Arizona and Utah, and it no doubt occurs in Nevada as well.

Mr. Douglas K. Duncan of Globe, Arizona, wrote of *rubrovenosa* that he and Mr. Frank H. Parker had collected it at the base of the Pinal Mts., 3,000–4,000 ft. in June, 1930 on “the stems of manzanita brush, only a pair were taken being difficult to see or locate in the first place as their song is stilled when approaching them, and as you notice they are a very pretty red which well matches the stems of the manzanita bush making them almost impossible to locate. Several were noted as they flew when trying to locate them and a pair taken.” In 1931 Mr. Duncan sent two male *rubrovenosa* collected in May at the base of the Pinal Mountains, Arizona.

Dr. John W. Sugden of Salt Lake City, Utah, wrote of *rubrovenosa* as follows: “The black cicada with the red wings (Washington County, July 6, 1930) was taken on a shrub that grew three or four feet high and had red stems with many upturned scales on the bark of the larger stems. With wings folded, the cicadas were even more protected by the coloration than the *Okanagana striatipes* on the sage brush. The song was even, regular, but not of great volume.”

Okanagana vanduzeei Distant and var. **consobrina** Distant, compared with **utaheneis** Davis and **californica** Distant.

Okanagana vanduzeei is now known from California, Oregon, Idaho, Nevada and Utah. The pale variety *consobrina* has also been collected in Utah and Oregon. In the original description of *consobrina*, Ann. and Mag. of Natural History, Series 8, August, 1914, p. 166, Mr. Distant states, that it is like *vanduzeei* except that the “two small pale spots in front of the cruciform elevation are larger and appear as the apices of two ill-defined obconical spots to the mesonotum, the lateral abdominal margins beneath are almost entirely ochraceous, the venation to the basal areas of both tegmina and wings is ochraceous; structural characters as in *O. vanduzeei*, and the specimens are received from the same locality as that from which the typical species was derived,” namely, San Diego County, California.

In this JOURNAL for March, 1915, Mr. Van Duzee gives descriptions of *vanduzeei* and var. *consobrina* and states that the variety is generally larger and more hairy than *vanduzeei*.

While *Okanagana californica* Distant resembles *consobrina*, it is smaller "with the surface more polished, the colors clearer, the pale markings more extended and the surface less densely clothed with pale scale-like hairs" (Van Duzee). In the writer's collection there are over 130 specimens of *californica* collected in numerous localities in the southern part of California.

In 1917 Prof. W. S. Wright sent me a series of *vanduzeei* and var. *consobrina*, collected at Dulzura, California, in June, that show the resemblance of *consobrina* to *vanduzeei*, except in color, as mentioned by Distant.

Okanagana utahensis, now known from the states west of the Rocky Mountains can be separated from *vanduzeei* by not being as black and from it and variety *consobrina* by its larger size, more protruding front of the head, and by being less hairy.

Dr. John W. Sugden has sent me a considerable series of *utahensis* collected from several broods appearing in recent years near Salt Lake City, and he, as well as Dr. Raymond H. Beamer, have collected both *vanduzeei* and var. *consobrina* in Utah.

A series of 54 *Okanagana utahensis* was kindly collected for me by Mr. and Mrs. Ernest L. Bell on the desert to the south of Fallon, Nevada, June 24, 1930. The "large congregation of them extended along the trail for three quarters of a mile or so," wrote Mr. Bell, and the bushes were "filled with cicadas." Many of the specimens were soft, having but recently emerged.

All of these species are included in a table of *Okanagana* in this JOURNAL, 1919, pp. 182-187.

OKANAGODES

In June, 1931, the writer collected many rather large, pale straw-colored *Okanagodes* along the shore of the Salton Sea in California, and in July, 1931, Mr. C. H. Gable, Jr., found two small, green *Okanagodes* at Terlingua, Texas, in the Big Bend country to the west of the Chisos Mountains. The green specimens showed noticeable structural characters different from *gracilis*, the only recorded member of the genus. This led to an examination of the seventy specimens of *Okanagodes* now in the writer's collection. In a general way they could be separated into three groups: moderately sized, often pearly gray indi-

viduals with dorsal dark markings and moderately swollen fronts to their heads (*Okanagodes gracilis*); generally larger specimens of a pale straw-color, pale pink, or greenish color, with the front of the head more swollen (*Okanagodes gracilis* var. *pallida*), and lastly the small all green specimens from the Big Bend of the Rio Grande in Texas, with a differently shaped head and uncus from the other two (*Okanagodes terlingua*).

Okanagodes gracilis Davis, the type species of the genus described from Utah specimens, with dark markings on the upper surface, has also been recorded from Lower California, Bagdad, Calif. (Morgan Hebard) and Saltdale, Mojave Desert, Calif. (A. C. Davis); Mina, Nevada (E. W. Davis), and several localities in Arizona. An account of its habits, song, etc., by L. D. and R. H. Beamer appeared in this JOURNAL, for September, 1930. As with other Cicadas, the members of the various broods of this species usually bear a close resemblance to one another; they all will be of the typical form with dark markings, or almost immaculate, as in variety *pallida* which has broods of its own.

***Okanagodes gracilis* var. *pallida* new variety.**

Type male and allotype female from the shore of the Salton Sea, California, June 21, 1931 (Wm. T. Davis). Davis collection.

This is a rather large pale colored insect with the front of the head much produced and more swollen or enlarged than is usual in *gracilis*. The Cu 1 vein in the front wing is curved upward much as in some of the species of *Clidophleps* and with a distinct though small "fuscous nodus" at the margin of the fore wing where Cu 2 and Cu 1b meet. The transverse fold crossing the front wing at the node is more evident than is generally the case in *gracilis*. The two inner obconical spots that extend backward from the front margin of the mesonotum are outlined, and the outer pair are very faintly discernible, or may be entirely absent as in some of the paratypes. The general color is pale straw-colored, or in some of the paratypes greenish, or even pinkish. The dark mark at the extreme base of the under side of the abdomen is absent, as it usually is in *gracilis*. The veins surrounding the marginal cells in the fore wing are darkened, the eyes are dark and the ocelli ruby colored, as in other *Okanagodes*.

This was a very common insect on the low vegetation close to the southwestern shore of the Salton Sea, California, not far

Measurements in Millimeters

	Male Type	Female Allotype
Length of body	23	23
Width of head across eyes	6	6
Expanse of fore wings	54	58
Length of valve	4	

from the road that now runs parallel to the lake through the Coachella Valley. Twenty males and eleven females were collected June 21, 1931, during the short time that we were at the side of the lake. All of the specimens are of a nearly uniform straw-color. The song was a low and continuous *zing*. The insects were not shy and were easily collected.

In the original description of *Okanagodes gracilis* in this JOURNAL, Vol. 27, p. 221, 1919, several of the specimens mentioned from Arizona as paratypes should be transferred to variety *pallida*.

Okanagodes terlingua new species. (Plate V, figs. 3 and 4)

Type male from Terlingua, Brewster County, Texas, July, 1931 (C. H. Gable, Jr.). Davis collection.

A small species with the front of the head and supra-antennal plates not as prominent as in either *gracilis* or *pallida*. The hook at the end of the uncus has the sinuation on the lower part less evenly curved than in *gracilis*, as shown in the illustration herewith and in that in this JOURNAL, Vol. 27, p. 221, 1919. The Cu1 vein in the fore wing is almost straight and more nearly parallel to Cu2; not curved upward as in *gracilis* and variety *pallida*. The transverse fold crossing the front wing at the node, and the node itself are obscure and hardly exist. There are four obconical, pale marks on the mesonotum extending backward from the anterior margin, the inner pair not as long as the outer pair. These marks are prominent in *gracilis* and but faintly represented in variety *pallida*. The eyes

Measurements in Millimeters

Length of body	17.0
Width of head across eyes	4.0
Expanse of fore wings	42.0
Length of valve	3.5

are brownish; the ocelli ruby colored; the general color green including the venation, except near the margin of the fore wings, where the veins are slightly darkened about the marginal areas. The base of the wings and about the tympana slightly yellowish green; beneath, the usual dark mark at extreme base of abdomen. This mark is absent in the single male paratype, which otherwise is like the type.

PLATYPEDIA

In "North American Cicadas Belonging to the Genera *Platypedia* and *Melampsalta*," published in this JOURNAL, June, 1920, ten species of *Platypedia* and three varieties of *Platypedia putnami* are described, and most of them figured. In this JOURNAL for 1921, *Platypedia laticapitata* is described on page 14, and *P. latipennis* on page 54. During the past few years it has become apparent that there exists a variety of *mohavensis* described in 1920 from Trumbull Mountain, northwestern Arizona, and two varieties of *Platypedia rufipes* described in 1920 from California. These varieties or geographic races with structural and color differences, may ultimately be considered as separate species when more specimens have been collected.

***Platypedia mohavensis* variety *rufescens* new variety** (Plate VI, figs. 1 and 2).

Type male, Jemez Springs, New Mexico, 6,400 feet, June 24, 1919, and allotype female from the same locality, June 14, 1919 (John Woodgate). Davis collections.

This variety has the uncus flat at the extremity and of the same shape as that figured for *mohavensis* in this JOURNAL, June, 1920, page 100, and also shown on the accompanying plate. It has thus far been found to the eastward of typical *mohavensis* and is conspicuous in having the pale orange of the costal margin of the fore wings, the membranes at the base of all

Measurements in Millimeters

	Male Type	Female Allotype
Length of body	19.0	18.5
Width of head across eyes	5.0	5.0
Expanse of fore wings	42.0	44.0
Greatest width of fore wing	8.0	8.0
Length of valve	4.5	

of the wings, and the paler parts of the body and legs replaced by red-orange or even red. In a typical *mohavensis* having the same expanse of wings as in the type of variety *rufescens*, the greatest width of a fore wing is 9 millimeters instead of eight.

In 1918, 1919 and 1920 I received from Mr. John Woodgate of Jemez Springs, N. M., 61 specimens of variety *rufescens*; Mr. Warren Knaus has sent me 4 specimens collected four miles southeast of Santa Fé, N. M., on the old Santa Fé Trail in scrub pine and cedar, June 15, 1918, with the statement that they made a "snap, snap, snap noise"; Mr. George P. Engelhardt has given me two males and two females collected at Estancia, N. M., June, 1929, and I have a male collected by Prof. Sherman C. Bishop and Richard C. Hart, June 21, 1930, 5 miles west of Ojo Caliente, N. M. Dr. Raymond H. Beamer has sent me for examination 64 males and 50 females of variety *rufescens* collected at Tajique, N. M., June, 1931, by Mr. J. G. Shaw, in which the fore wings are as usual narrower than in typical *mohavensis*. They were very numerous, and collected on pine, cedars, black locusts and oaks.

The specimens from Bondad, Colorado, and Chaves, New Mexico, mentioned in the original description of the species, should be transferred to variety *rufescens*. Owing to the different appearance of the New Mexican specimens collected in 1918 and 1919 by Mr. Woodgate they were not included in the original description of *mohavensis*.

Platypedia rufipes var. **bernardinoensis** new variety. (Plate VI, figs. 4 and 5)

Type male and allotype female, Cactus Flats, San Bernardino Mountains, California, June 8, 1925 (Alonzo C. Davis). Davis collection.

Variety *bernardinoensis* is a much larger insect than typical *rufipes* with darker colored legs and the venation of the fore wings black or nearly so, except for the costal margin which is orange, as are the membranes at the base of all of the wings and the paler markings of the body. In typical *rufipes* the venation of the fore wings is pale to the marginal cells.

In the original description of *rufipes* it is stated that: "In the collection of the California Academy of Sciences there is a large male with wings expanding 52 millimeters, from Bear Lake, San Bernardino Mts., Cali-

fornia, May 17, 1919 (J. O. Martin), that is considered here on account of the form of the uncus which resembles that of the type of *rufipes* except that it is much straighter along the lower line. The front of the head is prominent; the fore femora are chestnut colored, darkened beneath; femora of middle and hind pairs of legs striped with black; tibiae blackened at the basal joints. The fore wings have the costal margin bright orange to the end of the radial cell, but the remainder of the venation is darker than in the seven specimens of *rufipes*. This insect may belong to a distinct species."

The above is an accurate description of var. *bernardinoensis* and we give a figure of the specimen from Bear Lake on Plate VI, figure 4.

Measurements in Millimeters

	Male Type	Female Allotype
Length of body	21.0	20.0
Width of head across eyes	5.5	6.0
Expanse of fore wings	48.0	50.0
Greatest width of fore wing	9.5	9.5
Length of valve	5.0	

For comparison with *bernardinoensis* the original figure of the type of *rufipes* is here reproduced on Plate VI, figure 3.

In addition to the type and allotype Mr. Alonzo C. Davis sent me thirteen specimens of *bernardinoensis*, here placed as a variety, but like the next so called variety, is probably a distinct species.

***Platypedia rufipes* var. *angustipennis* new variety.** (Plate VI, figs. 7 and 8)

Type male and allotype female, Buckman Springs, San Diego County, California, June 23, 1925 (Prof. W. S. Wright). Davis collection.

Variety *angustipennis* differs from *rufipes* in being larger, in having the eyes more prominent, the venation of the fore wings (except the costal margin, which is orange), black or nearly so. In typical *rufipes* the venation of the fore wings is pale to the marginal cells. The membranes at the base of both pairs of wings are darker orange (or even red) in variety *angustipennis*, and the legs are blacker.

There are 33 paratypes of *angustipennis* in the writers collection, all collected in June, 1925, by Prof. Wright. Also two

Measurements in Millimeters

	Male Type	Female Allotype
Length of body	20.0	19.0
Width of head across eyes	5.5	6.0
Expanse of fore wings	48.0	50.0
Greatest width of fore wing	8.5	9.0
Length of valve	5.0	

females from Los Angeles Co., California without date (B. Neubath).

In the Sierra Ancha Mountains, Gila County, Arizona, there is a narrow winged *Platypedia* with the uncus as in variety *angustipennis*, and closely resembling it in other respects except that it is a little smaller. Mr. George P. Engelhardt collected a male, June 15, 1927, and I have received three males and six females from the same mountains collected in July, 1929, by D. K. Duncan and Frank H. Parker.

In closing this paper we give the following note on *Platypedia putnami* described by Uhler from Colorado, Bull. U. S. Geological and Geographical Survey of the Territories, iii, p. 455, 1877. It is copied from a letter kindly presented to me by Mr. John D. Sherman, Jr., and written by J. Duncan Putnam to Prof. Philip R. Uhler:

“Academy of Natural Sciences, Davenport, Iowa,

“June 27, 1877.

“Dear Mr. Uhler

“Your letter of May 11th and the pamphlets on Western Hemiptera were duly received and I am greatly obliged.

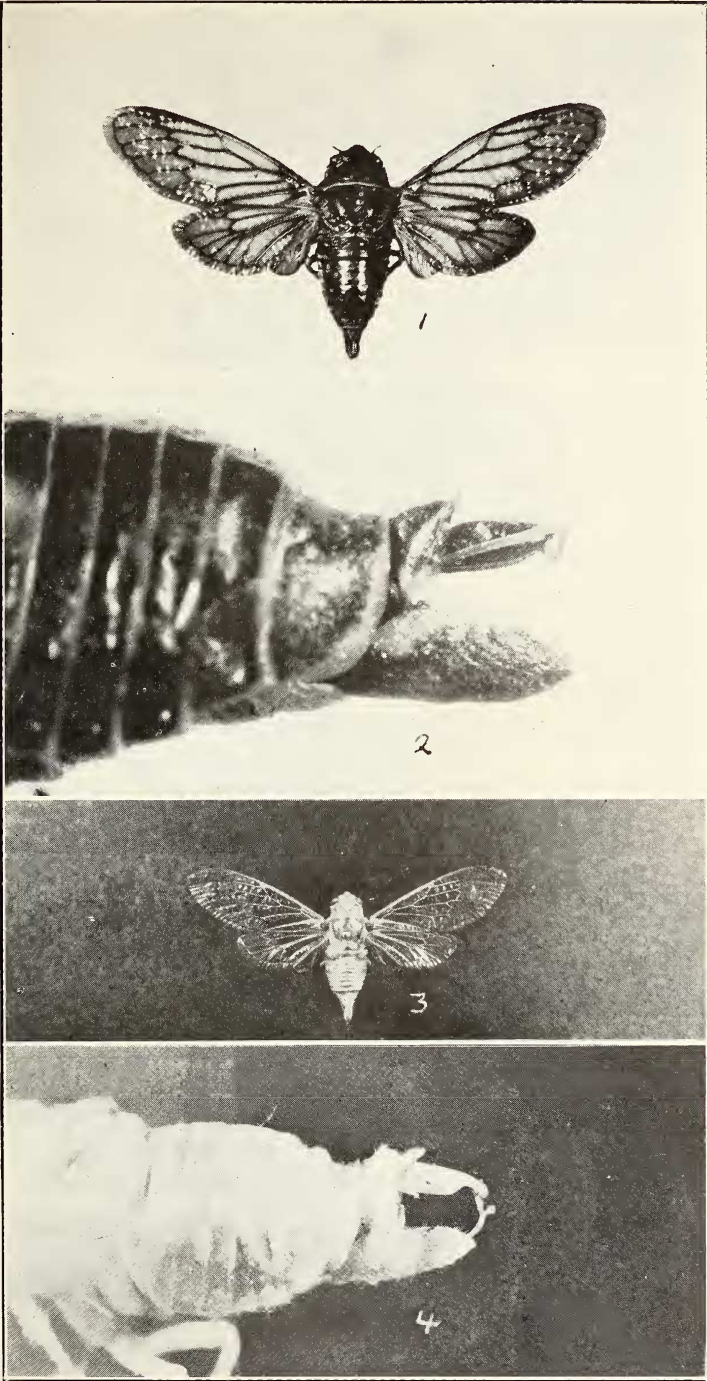
“I was quite surprised on turning over the pages to happen upon *Cicada putnami* and of course I felt pleased that so peculiar a species should be new. I found [it] not uncommon along the banks of Clear Creek between Floyd’s Hill and Idaho Springs on July 2d, 1872 and never at any other time. They were on shrubs—willow, birch or maple growing close to the edge of the water. The males make a peculiar very faint chirp.

“Sincerely your friend,

“J. Duncan Putnam.”

PLATE V

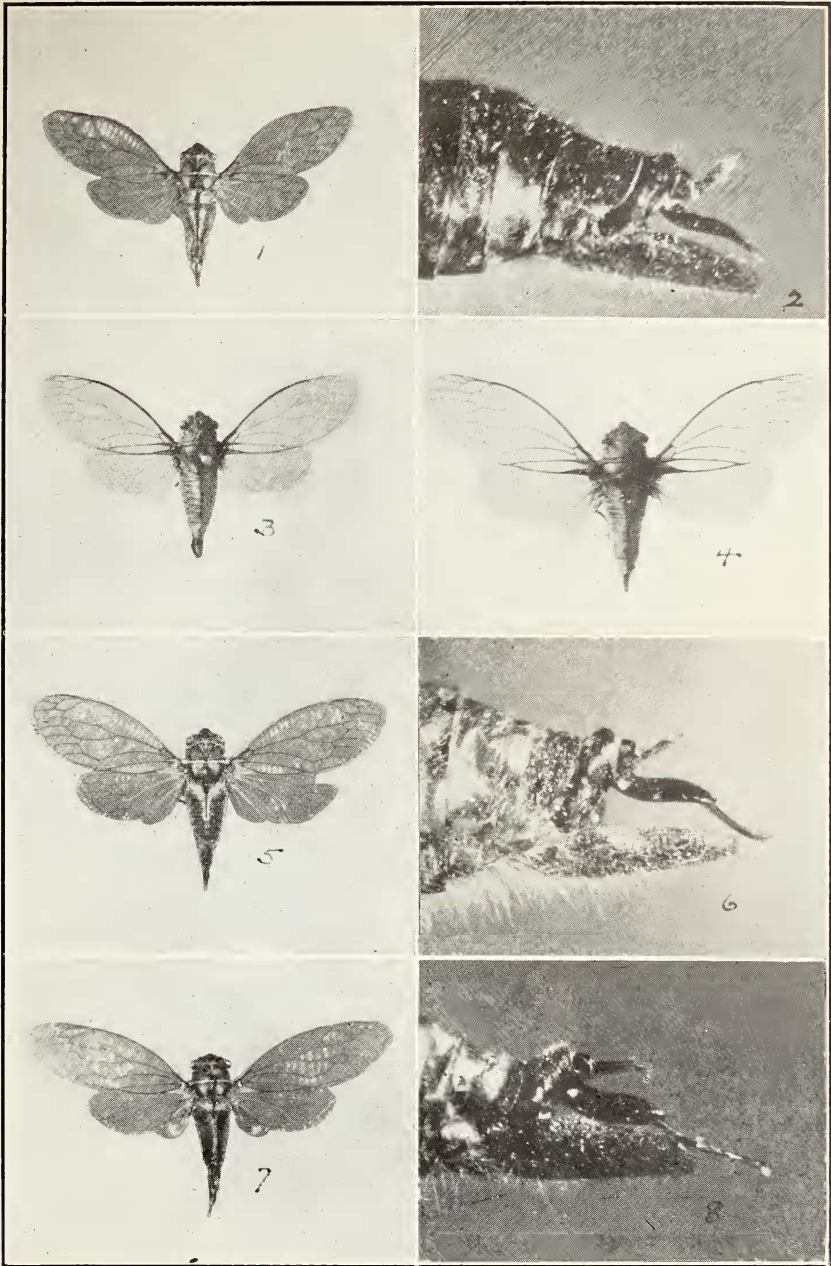
- Figure 1. *Okanagana fumipennis*. Type.
Figure 2. *Okanagana fumipennis*. Enlarged extremity of abdomen of type.
Figure 3. *Okanagodes terlingua*. Type.
Figure 4. *Okanagodes terlingua*. Enlarged extremity of abdomen of type.



CICADIDÆ

PLATE VI

- Figure 1. *Platypedia mohavensis* var. *rufescens*. Type.
- Figure 2. *Platypedia mohavensis* var. *rufescens*. Enlarged extremity of abdomen of type.
- Figure 3. *Platypedia rufipes*. Type figure reproduced.
- Figure 4. *Platypedia rufipes* var. *bernardinoensis*. Coll. Calif. Acad. Sciences.
- Figure 5. *Platypedia rufipes* var. *bernardinoensis*. Type.
- Figure 6. *Platypedia rufipes* var. *bernardinoensis*. Enlarged extremity of abdomen of type.
- Figure 7. *Platypedia rufipes* var. *angustipennis*. Type.
- Figure 8. *Platypedia rufipes* var. *angustipennis*. Enlarged extremity of abdomen of type.



CICADIDÆ

NOTE. The pale spots on the wings, and sometimes on the bodies of the insects, are due to high-lights in the photographs.